

broadly cuneate [Ming & Bartholomew, 2007]). Furthermore, *C. maiana* lacks pedicels, whereas *C. furfuracea* possesses pedicels that are 4–9 mm long (Sealy, 1958) or subsessile (Ming & Bartholomew, 2007). The distinct lack of flower color of *C. maiana* (translucent white) is a notable feature that distinguishes the newly described species from *C. furfuracea*, the latter species' flowers being greenish cream (Gao et al., 2005) or white (Ming & Bartholomew, 2007). The flower size of the newly described species seems to be confined to a narrow range, 5–8 cm diam., which is larger than the flower size of *C. furfuracea*, 40–45 mm diam. (Gao et al., 2005) or 20–35 mm diam. (Ming & Bartholomew, 2007). *Camellia maiana* possesses a distally 4-parted style that is fused in the bottom quarter, 10–12 mm long, not a 3-parted free style that is 15 mm long (Chang & Bartholomew, 1984), or a 3- to 5-parted free style that is 14–18 mm long (Gao et al., 2005). The ovary of *C. maiana* is 4-carpellate, not 3-carpellate (Sealy, 1958; Ming & Bartholomew, 2007). *Camellia maiana* produces mature fruit capsules that are globose to unevenly ovoid, 15–20 × 9–12 mm, not globose or oblate, 25–35 mm diam. (Chang & Bartholomew, 1984), or 20–40 mm long (Ming & Bartholomew, 2007).

Many of the species mentioned above have had a varied history. Chang and Bartholomew (1984) accepted both *Camellia liberistyla* and *C. liberistylodes* in section *Stereocarpus*, but Ming and Bartholomew (2007) treated both names as synonyms of *C. yunnanensis* var. *camellioides* (Hu) T. L. Ming in section *Heterogenea*. Chang and Bartholomew (1984) placed *C. yangkianensis* in section *Brachyandrae* with *C. nervosa*, but Ming and Bartholomew (2007)

placed it in synonymy under *C. crassipes* Sealy in section *Theopsis* Cohen-Stuart. Chang and Zeng (1982) had placed *C. luteoflora* in a monotypic section *Luteoflorae* Hung T. Chang; this was maintained by Chang and Bartholomew (1984), but Ming and Bartholomew (2007) included it in section *Stereocarpus*. These examples highlight the unstable nature of the infrageneric classification of *Camellia* and confirm the present authors' view of the unsatisfactory nature of the existing classifications and the need for further supporting evidence.

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# *Spiranthera atlantica* (Rutaceae, Galipeae), a New Species and the First Record of the Genus for the Brazilian Atlantic Forest

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**ABSTRACT.** A new species of *Spiranthera* A. St.-Hil. (Rutaceae, Galipeinae) is illustrated and described from Espírito Santo, Brazil. *Spiranthera atlantica* Pirani represents the first species record for the genus in the Atlantic Forest of eastern Brazil. The new taxon resembles the Amazonian *S. guianensis* Sandwith but differs by its smaller, few-flowered inflorescences and by the fruit and leaflet morphology.

**RESUMO.** Uma nova espécie de *Spiranthera* A. St.-Hil. (Rutaceae, Galipeinae) é descrita e ilustrada: *Spiranthera atlantica* Pirani, primeiro registro do gênero na Mata Atlântica brasileira. Ela se assemelha a *S. guianensis* Sandwith, que é uma espécie amazônica, mas difere pelas inflorescências pequenas e paucifloras, e por caracteres do fruto e dos folíolos.

**Key words:** Atlantic Forest, Brazil, Espírito Santo, IUCN Red List, Rutaceae, *Spiranthera*.

The Neotropical genus *Spiranthera* A. St.-Hil. is one of 26 genera forming the subtribe Galipeinae, tribe Galipeae (these names replacing the illegitimate Cuspariinae and Cusparieae, see Kallunki & Pirani, 1998), subfamily Rutoideae, Rutaceae. It is distinguished from other members in the Galipeinae by the following combination of characters: actinomorphic flowers, with five petals free from each other and from the five free, long-exserted filaments; basifixed anthers; and a 5-carpellate ovary borne on a conspicuous gynophore, connate ventrally and 5-lobed above, with an elongate, slender style. The fruit is a schizocarp of one to five mericarps, which are beaked and ventrally dehiscent as follicles.

Three species are recognized for the genus in South America (Groppo & Pirani, 2007). *Spiranthera odoratissima* A. St.-Hil. is a planaltine shrub, widespread in the cerrados (savannas) and open formations of Brazil (Rondônia, Mato Grosso, Pará, Maranhão, Piauí, Goiás, Bahia, and Minas Gerais) and Bolivia (Santa Cruz; *S. leopoldiana* Bamps & A. Robyns, described for Bolivia, is conspecific with *S. odoratissima*). The two other species are Amazonian forest trees or treelets: *S. guianensis* Sandwith, from Guyana, Venezuela, and northwestern Brazil (Ror-

aima, Amazonas, and Acre), and *S. parviflora* Sandwith, from Guyana, Venezuela, and northern Brazil (Roraima, Amazonas, Pará, and Maranhão) (Albuquerque, 1979; Kallunki, 2005).

Two recent collections from Linhares, Espírito Santo, eastern Brazil, represent the first records of the genus for the Atlantic Forest, and the new species is described here. Only adult or fully developed structures from the available herbarium specimens were used for the morphological descriptions. Flowers and fruits were rehydrated before most measurements and sketches were made. Terms used to describe two-dimensional shapes in the descriptions follow the definitions of Hickey (1979). Terms used to describe indumentum follow those of Radford et al. (1974), and terms used to describe inflorescences are those of Weberling (1989).

***Spiranthera atlantica* Pirani, sp. nov.** TYPE: Brazil. Espírito Santo: Linhares, Reserva Nat. CVRD, Estrada Louro, Km 0.3, 12 Jan. 2007 (fl.), D. A. Folli 5450 (holotype, SPF; isotypes, CVRD, NY). Figure 1.

Species nova *Spirantherae guianensi* Sandwith maxime affinis, quae tamen ab ea cymis paucifloris (20- ad 26-floris, non 50-floris vel plus), ramis floriferis brevioribus (1.2–2.5 cm, non 5–7.5 cm longis), foliolo terminali angustiore (3–5.3 cm, non 5–10 cm lato), disco truncato undulato (non 5-dentato), filamentis glabris (non pilosis) et fructibus rugosis (non transverse striatis) optime distincta.

Tree 5–12 m tall; young buds densely sericeous; branchlets brownish, glabrescent, with sparse lenticles. *Leaves* alternate, 3-foliolate; petiole terete to distally flat, 3–8 cm  $\times$  1–1.5 mm, striate, with prominent glands, puberulent mainly at its articulation with the leaflets; petiolules 4–12 mm when terminal, 2–8 mm when lateral, semiterete, puberulent; blade narrowly elliptic to obovate, 8–12.5  $\times$  3–5.3 cm when terminal, 6.5–11.5  $\times$  2–4.6 cm when lateral, base attenuate, apex acuminate (the acumen acute, 5–10  $\times$  1–2 mm), margin flat, chartaceous, pellucid-punctate, adaxial surface olive-green and dull, very sparsely puberulent to fully glabrescent, abaxial surface paler and dull, puberulent mainly on



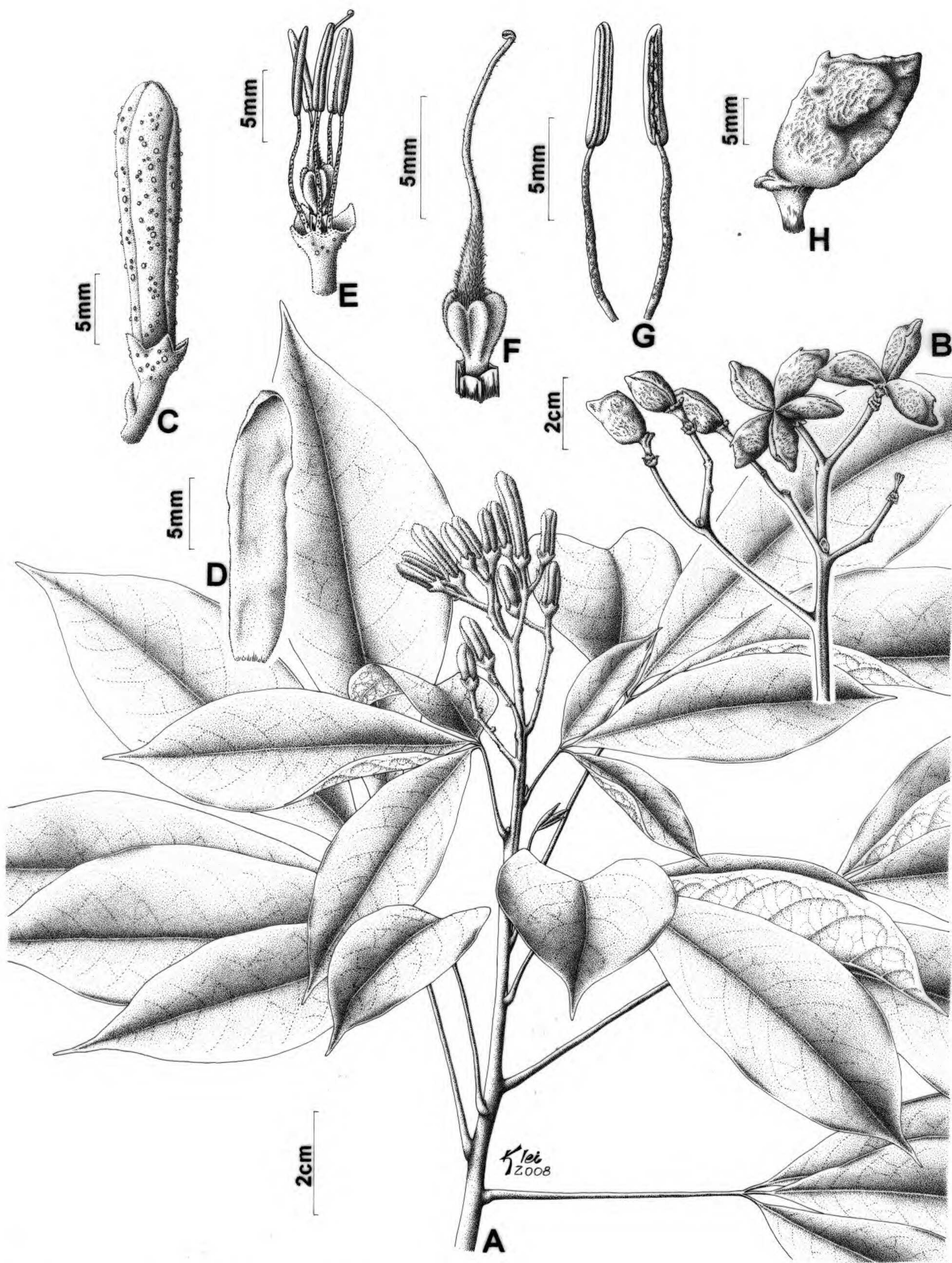


Figure 1. *Spiranthera atlantica* Pirani. —A. Flowering shoot. —B. Infructescence. —C. Floral bud. —D. Petal, adaxial view. —E. Flower, corolla removed. —F. Gynoecium, gynophore, and disc surrounding its base. —G. Stamens, lateral and abaxial views. —H. Immature follicle. A, C–G drawn from *Folli* 5450; B, H drawn from *Folli* 4788.

the veins; venation brochidodromous, midvein canaliculate on the adaxial surface, very prominent on abaxial surface; secondary veins 7 to 9 on each side of midvein, ascendent, arching, canaliculate on the adaxial surface, prominent on the abaxial surface. *Inflorescence* terminal, erect, a small corymbiform cymoid with partial florescences dichasial (usually 3-

flowered cymules), with 20 to 26 flowers per inflorescence, few-branched, shorter than the surrounding leaves, 6–8 cm including a puberulent, 0.5–2 cm long peduncle; side-branchlets of first order alternate to subopposite, ascending, the proximal branchlets 1.2–2.5 cm; bracts and bracteoles linear, 1–2 mm, pubescent; pedicel 3–4 mm, puberulent.



Table 1. Comparison of morphological features of *Spiranthera atlantica* and *S. guianensis*.

Characters	<i>S. atlantica</i>	<i>S. guianensis</i>
Petiole diameter	1–1.5 mm	2–2.5 mm
Petiolule of terminal leaflet	4–12 mm, slender	3–7 mm, thick
Blade of terminal leaflet	8–12.5 × 3–5.3 cm	9–21 × 5–10 cm
Secondary veins on each side of midvein	7 to 9	(7)10 to 12
Proximal branches of inflorescence	1.2–2.5 cm	5–7.5 cm
Flowers per inflorescence	ca. 20 to 26	50 or more
Filaments	glabrous	pubescent at base
Disc margin	truncate, undulate	5-dentate
Remnant of style in fruit	prominent, curved	indistinct
Fruit surface	rugose	transversely striate

*Flowers* with the calyx cotyliform, greenish white, tube ca. 3 mm, pubescent; lobes 5, deltoid, ca. 2 × 2.4 mm, tomentose to pubescent; corolla tubular, rounded at apex in bud, actinomorphic, cream, with several glands; petals 5, imbricate (cochleate), oblong, subacute at apex, 20–22 × 4–5 mm in bud, shortly and densely appressed-pubescent on both surfaces (trichomes on inner surface shorter); stamens 5, alternate to the petals and to the lobes of the disc, glabrous; filaments free, 8–11 mm, flattened, glandular-punctate, glabrous; anthers lorate, 6–7 mm, basifixed, slightly notched at base, the connective glandular-dotted; disc cupular, truncate, undulate, with 5 prominent angles, ca. 1.2 mm high, glabrous; ovary of 5 densely sericeous carpels connate ventrally and deeply 5-lobed above, borne on a slender, glabrous gynophore that is slightly longer than the disc, the combined length of ovary and gynophore ca. 5.9 mm; ovules 2 per carpel; style in bud 12–14 mm long, tomentose at base, sparsely pubescent and gland-dotted above; stigma clavate, slightly 5-lobed. *Fruit* a schizocarp of 1 to 5 rhomboid follicles, stellately arranged, united only by a short median axis, each dehiscent ventrally (by the suture), 12–14 × 10–12 mm, sparsely pubescent to glabrescent, rugose, blackish, with a dorsal obtuse keel terminated by a prominent deltoid beak 4–5 × ca. 4 mm (width at base), and a short, prominent, curved remnant of the style base at the apex of the suture; the calyx and disc persistent at the base of the fruit, the gynophore thickened and elongated up to 6 mm. Mature seeds not seen.

*Distribution and habitat.* This species is known so far only by two collections from Espírito Santo, eastern Brazil. *Spiranthera atlantica* is found on riverbanks in wet tropical forest and in the mata de tabuleiro, a forest type occurring on patches of Tertiary terrain found among the Quaternary sandy soils that prevail along the Atlantic coast of Espírito Santo.

*IUCN Red List category.* Because of the scarcity of collections, the new species is assessed as Data

Deficient (DD) according to IUCN Red List criteria (IUCN, 2001).

*Discussion.* The leaves and flowers of the new species are similar to those of the allopatric species *Spiranthera guianensis*, which has a broader Amazonian distribution. They can be distinguished mainly by the characters presented in Table 1.

*Spiranthera atlantica* can be easily distinguished from the remaining two species of the genus. *Spiranthera parviflora*, an Amazonian treelet, has dense corymbiform inflorescences with numerous small flowers (petals < 1.2 cm vs. > 2 cm long), and *S. odoratissima*, a shrub from the cerrado (Brazilian savannah) and other open formations, has leaflets subsessile and ovate to cordate at the base (vs. distinctly petiolulate and attenuate at base).

The Forest Reserve at Linhares has been studied continuously for years, but the recent collection of this new species shows that the high diversity of the Atlantic Forest in Espírito Santo State is still poorly known and that fieldwork related to botanical inventory is still necessary.

*Paratype.* BRAZIL. **Espírito Santo:** Linhares, Reserva Nat. CVRD, Estrada Louro, Km 0.4, 24 Mar. 2004 (fr.), D. A. Folli 4788 (CVRD, SPF).

*Acknowledgments.* I am grateful to Domingos Folli and Renato Moraes de Jesus for sending me all the collections of Rutaceae made at the Reserve Natural da Companhia Vale do Rio Doce in Linhares; to Klei Rodrigo Sousa for preparing the beautiful illustration; to Jacquelyn Kallunki and Milton Groppo for many helpful comments while reviewing the manuscript; and to the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) for financial support for this research project.

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